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# Determinants of Economic Growth in Ghana

Christian Kwasi Darko[1]

**Abstract**

Determinants of economic growth in Ghana are analysed using restricted vector autoregressive (VAR) model for the period 1975-2013. The empirical results reveal that GDP per capita in long-run is driven by export, oil and mineral rents while government consumption retard economic growth. Therefore the dynamic relationship between these variables on economic growth should not be underestimated by policymakers. However, Ghana's economic growth is subject to uncertainty associated with expected risks of price volatility of primary commodities which make a great proportion of the export and the so-called Dutch disease which may hinder economic growth in the long-run.

Keywords: economic growth, export, error correction model, weak exogeneity.

JEL Classification: O10, C22

## 1. Introduction

The question of what determines economic growth, specifically in long-run has raised a lot of controversies over the years considering arguments from both the demand-and supply-side factors of economic growth. These controversies have increased research on this topic. However, a consensus is yet to be reached given the various contributions by different schools of thought. This paper will verify empirically if export are the most important determinant of real GDP per

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capita growth in the context of the Ghanaian economy. Several studies have empirically shown that export and economic growth are positively correlated. Among others Balassa (1978), Tyler (1981), Bahmani-Oskooee and Alse (1993), Boame (1998) and Ekanayake (1999). According to Tyler (1981) export is the main determinant of economic growth in developing countries. Additionally, mainstream economists argued that exports of primary commodities are the only way poor resource-based economies generate their foreign exchange. This is necessary to pay for imports and external debts, reducing unemployment through creation of job opportunities, which will increases the standard of living and enhances socio-economic development as well.

A favorable exogeneous factor of price boom on primary-export commodities such as cocoa, gold and oil has played an important role in the economy of Ghana in the past few years. For example, economic growth reached a record of 15.0 percent in 2011, as a result of high prices of gold in the international market and the start of oil production. Therefore, minerals and oil rents are also important determinants of Ghana's long-run economic growth (see Herrera and Aykut, 2014). The positive effect of these resources rents (oil and mineral) increases the level of export receipts which lead to increase economic growth rate. On the contrary, these primary-export commodities are associated with risks, which are due to international price volatility and so-called Dutch disease which relate to Ghana post-oil discovery.

According to Barro (1991) high rate of government spending have a negative effect on economic growth rate. Consequently, government inability to control public spending may hinder economic growth performance in the long-run. Despite the downside risks, Ghana's growth prospects are positive in the long-run (see Raggl, 2014).

To discover the true underlying driving forces behind the long-run economic growth of Ghana, a model is developed empirically to examine the level of influences of these endogenous

variables (export, gross fixed capital formation, natural oil and mineral rents and government consumption) on economic growth of Ghana. The rest of the paper is organised as follows: Section two reviews the economic background of Ghana. Section three explains the model and the interpretation of the empirical results of the study. Section four points out some risks related to the long-run economic growth of Ghana. Section five concludes this paper with some policy recommendations.

## 2. Economic Background

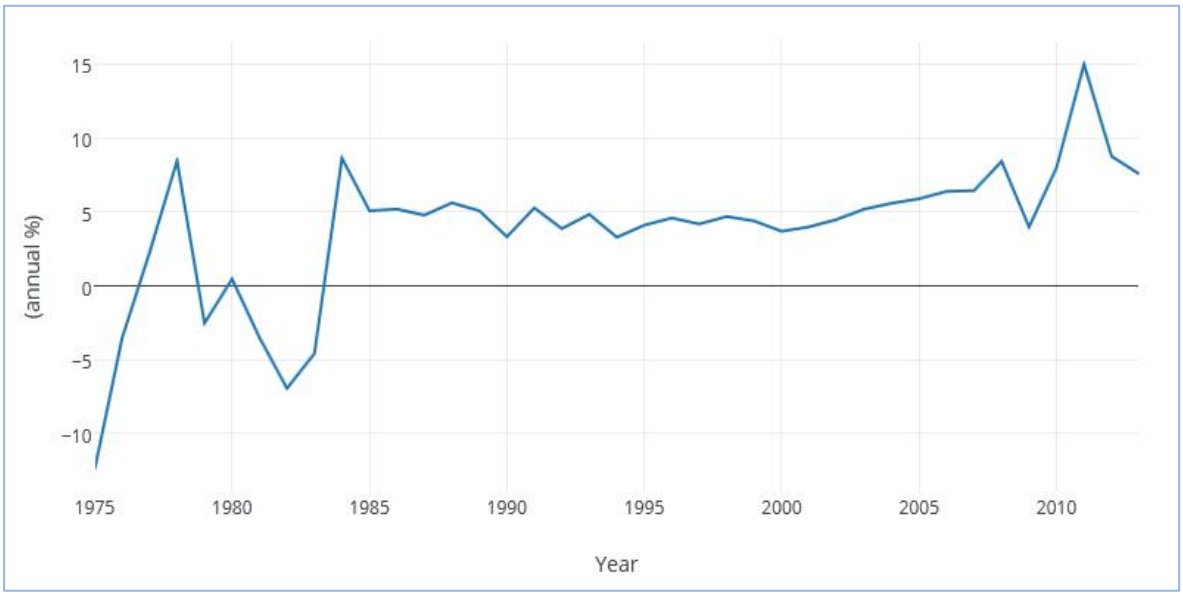
After years of economic struggles, Ghana gained its independence from Great Britain in 1957; the economy was stable and flourishing with the same level of GDP per capita to that of South Korea during 1957/58. After independence, the first president of Ghana Kwame Nkrumah took external funds to set up agricultural industries to process primary commodities for export, using the revenues from cocoa as security. Unfortunately the price of cocoa dropped in the mid-1960s. The fundamental stability and flourishing of the Ghanaian economy was wiped out and as a result Nkrumah was overthrown in 1966.[2] Since then, the economy has experienced high volatility in the 1970s and early 1980s due to political instability. Specifically, in 1978, 1979 and 1982 showed negative growth rate partly due to military coups in 1978, 1979, 1981 and 1982 under the leadership of Flight Lieutenant Jerry John Rawlings. Jong-a-Pin (2009) suggests that a high degree of political instability slows down economic growth. In addition, the economy of Ghana nearly collapsed in 1983 when inflation hit 123% because of the devastating drought which reduced the production of main agricultural commodities and other export crops such as cocoa (Anyemedu, 1993). The fall of export in 1983 decreased both real GDP growth and real gross fixed capital formation because agriculture was the pivot of the Ghanaian economy. Aisen and Veiga (2006)

[2] La Verle Berry (1994) provides a more detailed description.

points out that political instability also leads to higher inflation. Ghana had a relatively high inflation averaged more than 50% a year between 1976 and 1981. But in 1981 inflation rate was 116.5% as a result of the military coup in 1981.

According to the World Development report of 1987, a high rate of inflation increases uncertainty, discourages investment, distorts relative prices, and stands in the way of sustainable growth[3]. Therefore, the primary cause of poor macroeconomic performance such as per capita gross domestic product (GDP) and inflation rate in Ghanaian economy of the pre-SAP era may be attributed to political instability. This has resulted in high volatility of GDP per capita growth from 1975-1984 see figure 1.

**Figure 1: GDP annual growth (%) of Ghana, 1975-2013**




***Source:*** *World Development Indicators, 2015*

[3] World Bank Development Report (1987, p.14) notes "from the recovery and adjustment to long-term growth"

In developing countries in Africa and Latin America the 1980s were called the lost decade, because it was a decade of negative growth rates (Fischer, 1991). This resulted in the implementation of the Economic Recovery Program (ERP) under the Structural Adjustment Programs (SAPs)[4] in 1983. The aim of this program was to restore the Ghanaian economy and its external equilibrium in order to make the economy more efficient and sustainable, and thereby increasing economic growth as well (World Bank 1988, 1990a). More specifically, Economic Recovery Program One (ERP I), the first phase of the SAPs, emphasized the promotion of the export sector and an enforced fiscal discipline, which together aimed to eradicate budget deficits. This resulted in constant growth in GDP, reduced inflation, created budget surplus, and increased export earnings after 1983. After a year of implementation of the structural reform, the economy responded positively from its negative growth rate of about 5% in 1983 to a hefty positive rate of 8% in 1984[5]. The quick response of economic growth in 1984 was attributed to income received from privatization of state-owned industries and resources. The aim of this policy was to increase efficiency and investment and decrease state spending. This generated a fiscal surplus that increased growth in 1984 after the structural adjustment policy in 1983 as shown in figure 1. Favorable growth continued for the next 30 years, high inflation rate had been reduced to about 12% for the last five years.

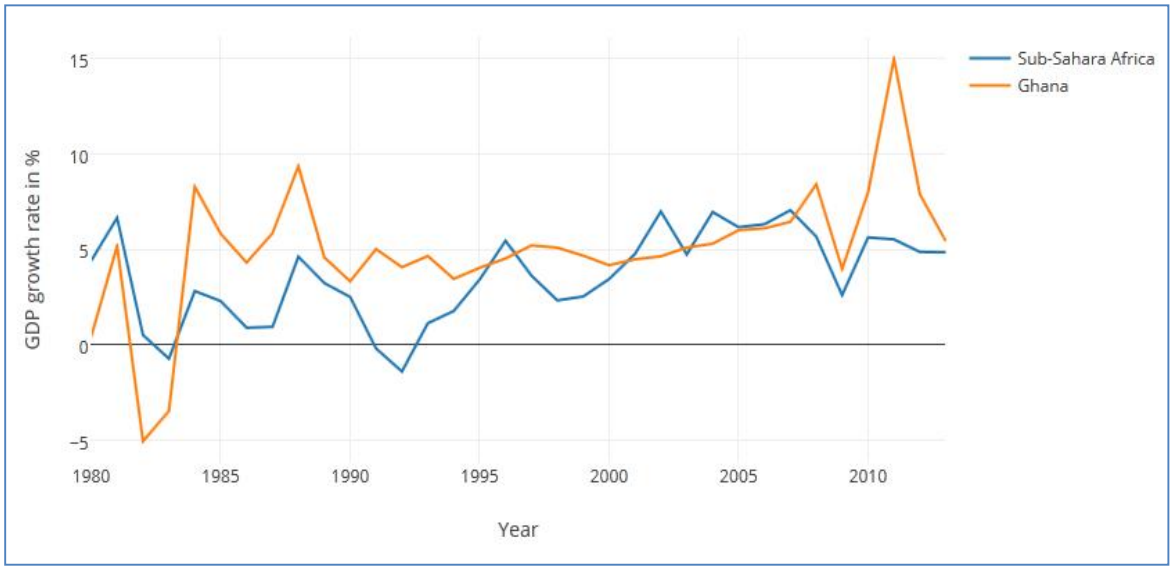
GDP growth has been exceptionally strong during the last decade averaging 7.38%. In 2011, Ghana achieved its highest economic growth of 15.0% as the result of discovery of oil from the Jubilee oil field and high prices of its primary-commodity export in the international market. The revenue from export receipts such as; oil (USD 2.6 billion), gold (USD 4.5 billion) and cocoa

[4] SAPs was sponsored by World Bank and International Monetary Fund (IMF) in form of a loan to countries with economic crises in early 1980s

[5] Augustin Kwasi Fosu, Emerging Africa: The Case of Ghana. OECD, 2001

(USD 1.9 billion) increased Gross Domestic Growth (GDP) and government revenues in 2011 and this contributed significantly to poverty reduction[6]. This raised the question about the expected impact of natural resources on growth specifically oil rents and non-oil rents (mineral). However, the fiscal deficit fell from 5.9% of GDP in 2010 to an estimated 4.3% in 2011 due to strong revenue performance from exports from oil, gold and cocoa. In 2013 growth decelerated to 4.4%, considerably lower than the growth of 7.9% achieved in 2012. Moreover government consumption expenditure bloated in 2012, which is marked by an unprecedented budget deficit in the history of Ghana of around 12% of GDP. The situation persisted in 2013, with about the same level of budget deficit[7]. In addition, continuing widening of budget deficit has been a major constraint to fiscal and debt sustainability and this has been a major concern among policymakers in Ghana of late.

**Figure 2: GDP annual growth (%) of Ghana and Sub-Sahara Africa, 1980-2013**




***Source:*** *World Development Indicators, 2015*

[6] See Africa Economic Outlook 2013 for more details
[7] Source: African Economic Outlook 2014

The Ghanaian economy has consistently performed better than Sub-Saharan Africa countries in terms of economic performance. The total economic performance of Ghana has expanded at an average annual rate of 9.70% from 1980 to 2013 compared to other Sub-Saharan Africa (SSA) countries which have recorded an average expansion rate of 7.02%. Additionally SSA average growth rate was higher than Ghana in early 1980s due to political instability but after the structure adjustment reform in 1983 the Ghanaian economy has been better than that of Sub Sahara Africa countries as depicted in figure 2.

## 3. Estimation and Discussion of Empirical Results

This section, estimate and analysed the empirical results using annual time series data for the period 1975 to 2013. The data were taken from World Development Indicators (WDI) in 2015. In this study, the variables consist of export, gross fixed capital formation (GFCF), oil rents, mineral rents, government consumption and the change in real Gross Domestic Product (GDP) as the measure of economic growth see Table 1 for descriptive analysis for all the variables. The entire estimation procedure consists of three steps: unit root test, cointegration test and error correction modelling.

### 3.1. Data

**Table 1: Description of variables**

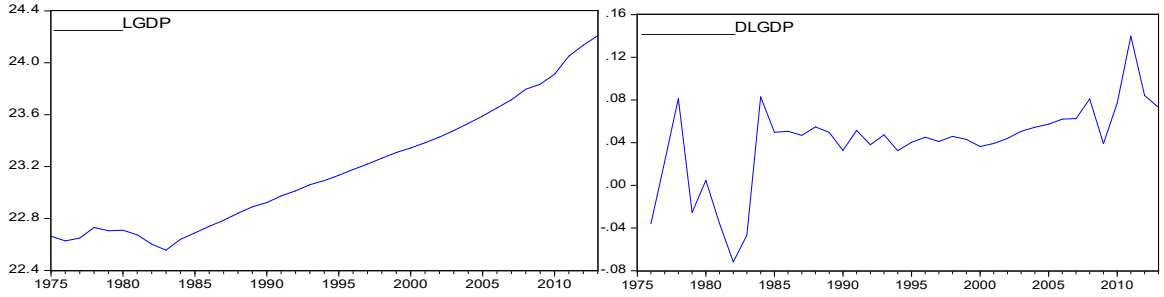
| Variable | Description | Source |
|---|---|---|
| GDP | Real GDP per capita | WDI |
| Export /GDP | Exports of goods as a ratio to GDP | WDI |
| GFCF/GDP | Gross fixed capital formation as a ratio to GDP | WDI |
| Government consumption/GDP | Government consumption as a ratio to GDP | WDI |
| Oil Rents | Oil rents as share of GDP | WDI |
| Mineral Rents | Mineral rents as share of GDP | WDI |
| Dumoil | Dummy equal to zero for pre-oil exploitation and one for post-oil exploitation | - |
| Dumcoup | Dummy equal to one if there was a coup and zero otherwise | - |

**Source:** *World Development Indicators, 2015.*

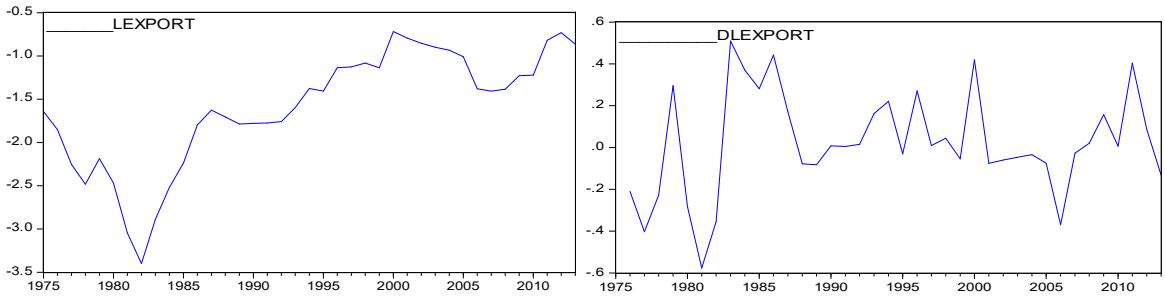
### 3.2. Testing for Stationarity

Macroeconomic time series are mostly nonstationary, it is now quite well known that the spurious correlations may emerge among variables which are nonstationary over time see Granger and Newbold, 1974; Phillips, 1986. Therefore, we examine each variables using graphical support to verify the time-series properties see Figure 3.

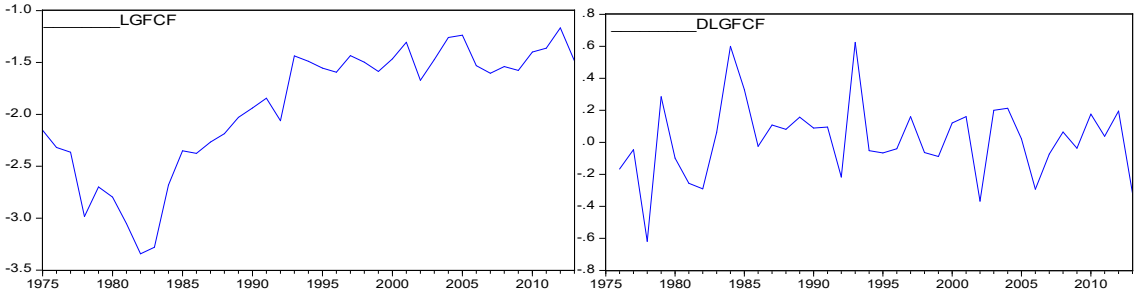
**Figure 3: Levels and First Differences of the variables, 1975-2013**



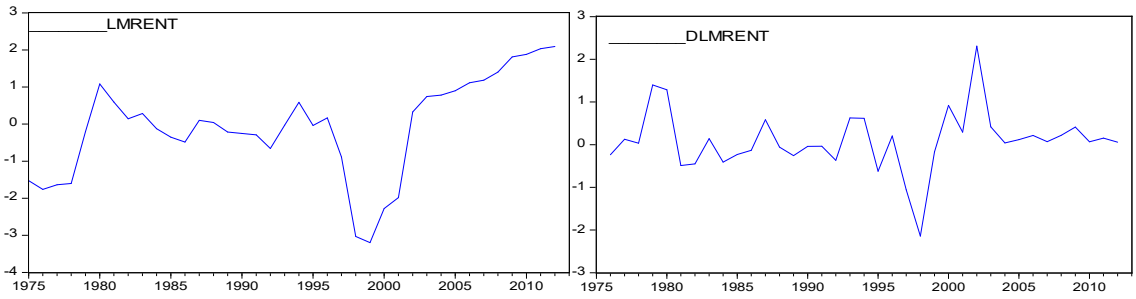

**(a)**



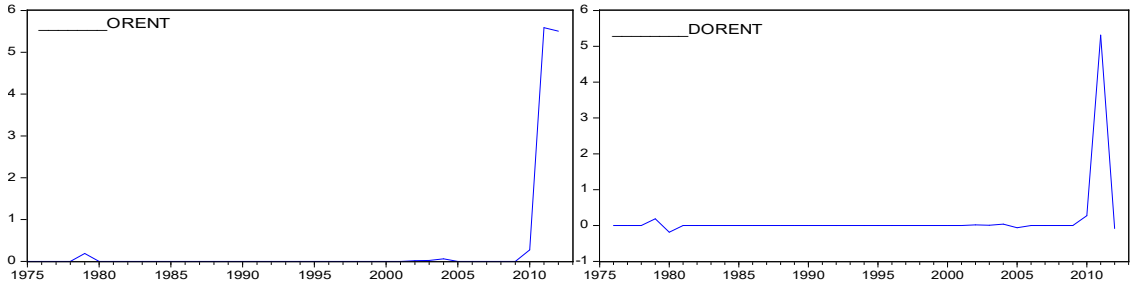

**(b)**



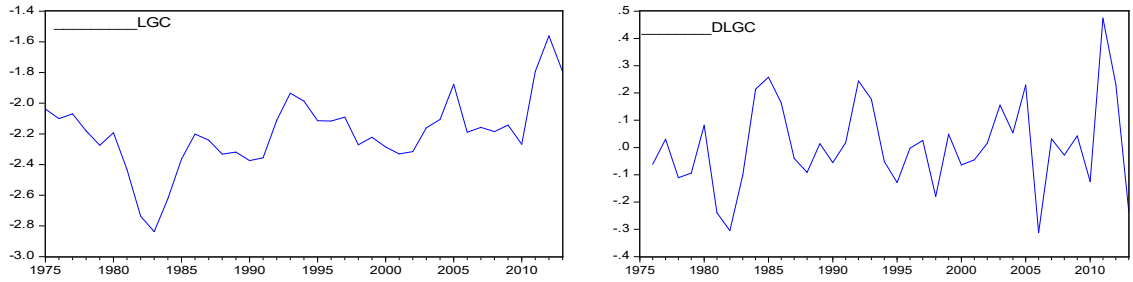

**(c)**




**(d)**




**(e)**




**(f)**

**(a)** GDP per capita growth rate, 1975–2013; **(b)** Export, 1975–2013; **(c)** Gross Fixed Capital Formation, 1975–2013; **(d)** Mineral Rents 1975-2013; **(e)** Oil Rents,1975–2013; **(f)** Government consumption, 1975–2013.

Moreover, Perron (1989) argues that in the presence of a structural break, the ADF tests are biased towards the non-rejection of the null hypothesis. But, it is also inappropriate to test for a structural break with short sample because the ADF test will have problem of low power due to small sample size. The ADF model can be tested by the estimation of $\alpha_2$ from the equation, we reject the null hypothesis of $\beta_2 = 0$ and accept the alternative hypothesis of $\beta_2 < 0$ which is given in the equation below:

$$\Delta y_t = \alpha_0 + \alpha_1 t + \alpha_2 y_{t-1} + \sum_{l=1}^{k} \varphi_i \Delta y_{t-i} + \varepsilon_t \quad (2)$$

Where Δ denotes the first difference, **y** is the time series being tested, **t** is time, and **k** is the appropriate number of lags selected through the Schwarz information criterion (SIC) over nine maximum lags, **T** is a linear time trend and **$\varepsilon_t$** represents the residuals. Non rejection of the null hypothesis concludes that, the time series is nonstationary but the rejection of the null shows the time series is stationary[8]. The Augmented Dickey-Fuller test on these endogenous variables (LGDP, LEXPORT, LGFCF, ORENT, LMRENT and LGC) suggest they are non-stationary in levels but the tests on their time differences confirm stationarity see Table 2, so we conclude that they are integrated of order one I (1). Therefore the precondition of Johansen cointegration has been met.

**Table 2: Testing for unit root**

| | **Level** | | | **First** | | **Differences** |
|---|---|---|---|---|---|---|
| **Variable** | 5% Critical Value | ADF Statistics | Prob. | 5% Critical Value | ADF Statistics | Prob. |
| LGDP | -2.941145 | 4.182232 | 1.0000 | -2.943427 | -3.590473 | 0.0108** |
| LEXPORT | -2.941145 | -0.810266 | 0.8047 | -2.943427 | -5.409786 | 0.0001** |
| LGFCF | -2.941145 | -1.423896 | 0.5605 | -2.945842 | -5.812513 | 0.0000** |
| ORENT | -2.943425 | 0.008171 | 0.9534 | -2.945842 | -5.801214 | 0.0000** |
| LMRENT | -2.943427 | 1.405615 | 0.9987 | -2.945842 | -5.075737 | 0.0002** |
| LGC | -2.941145 | -2.047184 | 0.2664 | -2.954021 | -4.222254 | 0.0023** |

*denotes rejection of the hypothesis at the 5% level

### 3.3. Johansen Cointegration Test

Engle and Granger, 1987; Johansen, 1988; Johansen and Juselius, 1990; Pesaran et al., 2001 used the cointegration test to determine the presence of potential long-run equilibrium relationship. The

[8] Using the 5% level of significance

methodology on cointegration test was developed by Johansen (1988) which takes its starting point from the unrestricted VAR given by:

$$y_t = u + \sum_{i=1}^{p} \Pi_i \, y_{t-1} + \varepsilon_t \tag{3}$$

Where $\mathbf{y_t}$ represents all the **N** variables in the model, **p** is the **NxN** matrix of parameters, $\boldsymbol{\varepsilon_t}$ is the errors term and it is distributed as $N(0, \sigma^2)$ . We can rewrite the VAR as;

$$\Delta y_t = u + \Pi y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta y_{t-1} + \Gamma_k y_{k-1} + \Psi x_t + \varepsilon_t \tag{4}$$

Where $\boldsymbol{\Gamma_i}$ = -I + $\Pi_1$+……. + $\Pi_i$ (I is a unit matrix), **y** = (LGDP, LEXPORT, LGFCF, ORENT, LMRENT, LGC) and **x** (DUMCOUP, DUMOIL). These two dummy variables were included in the model to account for the potential influences of important exogenous factors in the economy of Ghana: (i) DUMCOUP to capture the years of military coup in 1978, 1979, 1981 and 1982 and drought in 1983 (ii) DUMOIL to capture a possible structural break due to the discovery of oil in 2011. The rank of $\Gamma_k$ (**NxN** matrix) can be equal to **N,** if all the variables in $y_t$ are not cointegrated. If the rank of $\Gamma_k$ is equal to R but less than N, then R indicates the number of cointegrating vectors that exists which represent $\boldsymbol{\Gamma_k}$ such that $\boldsymbol{-\Gamma_k} = \alpha\beta'$, where **α** and **β** are NxR matrices. Johansen proposed maximum eigenvalue and trace statistic are based on the number of significant eigenvalue of Π. A test of zero restrictions on **α** is the test of weak exogeneity when the parameters of interest are long-run see Luintel (2002). Engle et al. (1983) introduced weak exogeneity as sufficient condition for valid inference on the parameters of a conditional distribution in a framework of 1(0) variables, still holds when variables are 1(1) and there is cointegration. When variables are cointegrated then granger causality test is inappropriate. Therefore our parameters

are long-run only. Engle and Granger (1987, p. 273) argue that the simple way to check weak exogeneity for the parameters of interest is to estimate an ECM and test the significance of the error correction term in other equations in the model. The outcome of the test reveals that LGFCF, ΔLMRENT and LGC are weakly exogenous while ΔLEXPORT and ΔORENT are not weakly exogenous.

Table 3 reports that, there is one cointegrated equation at 5 percent level in the model which is confirmed by both Trace test and Max-eigenvalue test. In conclusion, there is a long-run relationship between LGDP, LEXPORT, LGFCF, ORENT, LMRENT and LGC. In other words these variables share common stochastic trend. But in the short-run there may be disequilibrium from their equilibrium values, and it is important to test whether or not such disequilibrium converges on the long-run stability.

**Table 3: Johansen Cointegration Test Results**

| | **Trace Test ($\lambda_{trace}$)** | | | **Maximum Eigenvalue Test ($\lambda_{max}$)** | |
|---|---|---|---|---|---|
| No. of CE(s) | Eigenvalue | Trace Statistic | 5% Critical Value | Max-Eigen Statistic | 5% Critical Value |
| None * | 0.718339 | 66.68485 | 47.85613 | 44.34678 | 27.58434 |
| At most 1 | 0.285573 | 22.33806 | 29.79707 | 11.76962 | 21.13162 |
| At most 2 | 0.225521 | 10.56845 | 15.49471 | 8.944784 | 14.26460 |
| At most 3 | 0.045331 | 1.623661 | 3.841466 | 1.623661 | 3.841466 |

**Note:**
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level

### 3.4. Vector Error Correction Model (VECM)

Engel and Granger (1969) suggested that if cointegration exists among all variables then proper statistical inference is obtained by analyzing an error correction model (ECM). Moreover,

error correction model and cointegration test bring together both long-run and short-run information in modelling time series data. The general formula of the VECM is as follows[9].

$$\Delta LGDP = \beta_0 + \lambda_1 ECM^{1}{}_{t-1} + \sum_{l=1}^{m} \beta_{11} LGDP_{t-1} + \sum_{l=1}^{m} \beta_{12} LEXPORT_{t-1} + \sum_{l=1}^{m} \beta_{13} LGFCF_{t-1} + \sum_{l=1}^{m} \beta_{14} ORENT_{t-1} + \sum_{l=1}^{m} \beta_{15} LMRENT_{t-1} + \sum_{l=1}^{m} \beta_{16} LGC_{t-1} + \psi x_t + \varepsilon_{1t} \quad (5)$$

Where Δ is the first difference operator, $ECM_{t-1}$ is the error correction model term lagged one period, $\lambda$ is the short-run coefficient of the error correction model term ($-1 < \lambda < 0$), $\Psi\chi_t$ coefficients show the effect on the dynamics of external events and ε is the white noise. Table 4 reports the normalized cointegrating coefficients in the model. The estimated coefficients imply that an increase in export, oil and mineral rents by 1% per year are likely to increase growth in long-run by 1.10%, 7.03% and 0.38% per year respectively. While a rise in government consumption by 1% per is likely to decrease growth in long-run by 0.55% per year in long-run.

**Table 4: Results of Vector Error Correction Models in Long-Run, (1979-2013)**

| Variables | Coefficients | Standard Errors | t-statistics |
|---|---|---|---|
| LEXPORT | -1.099569 | 0.40960 | -2.68446** |
| LGFCF | -0.220711 | 0.50052 | -0.44096 |
| ORENT | -7.028935 | 2.42855 | -2.89429** |
| LMRENT | -0.384508 | 0.06932 | -5.54653** |
| LGC | 0.559710 | 0.58931 | 2.94977** |

** denotes rejection of the hypothesis at the 0.05 level

The coefficients of the error correction term in Table 5 explain how variables deviate from its long-run equilibrium. Furthermore, the error-correction model term of GDP is significant, implying that GDP adjust from the short term disequilibrium to equilibrium in the long term. But the speed of

[9] See J. Granger (1969) and Mishra (2011)

adjustment is low for GDP to restore to its equilibrium path. Thus in every period there will be 2.3% convergence for the economy to restoring to its long-run equilibrium.

**Table 5: Estimates of the Error Correction Models in Short-Run, 1979-2013**

| | ΔLGDP | ΔLEXPORT | ΔLGFCF | ΔORENT | ΔLMRENT | ΔLGC |
|---|---|---|---|---|---|---|
| ECT1 | -0.015582<br>(0.00686)<br>[-2.27108] | 0.300064<br>(0.06308)<br>[ 4.75706] | 0.128095<br>(0.07374)<br>[ 1.73700] | 0.048443<br>(0.02613)<br>[ 1.85379] | 0.850478<br>(0.26015)<br>[ 3.26917] | 0.082664<br>(0.05195)<br>[ 1.59133] |
| ΔLGDPt-1 | 0.262086<br>(0.11124)<br>[ 2.35604] | 1.070522<br>(1.02271)<br>[ 1.04675] | 0.016922<br>(1.19567)<br>[ 0.01415] | 0.787077<br>(0.42369)<br>[ 1.85767] | 7.060526<br>(4.21799)<br>[ 1.67391] | 0.917447<br>(0.84224)<br>[ 1.08929] |
| ΔLEXPORTt-1 | 0.047735<br>(0.01871)<br>[ 2.55105] | 0.053434<br>(0.17203)<br>[ 0.31061] | 0.423429<br>(0.20113)<br>[ 2.10530] | 0.052220<br>(0.07127)<br>[ 0.73271] | -0.929940<br>(0.70951)<br>[-1.31067] | 0.087872<br>(0.14167)<br>[ 0.62024] |
| ΔLGFCFt-1 | -0.026114<br>(0.01714)<br>[-1.52394] | -0.176660<br>(0.15754)<br>[-1.12134] | -0.458547<br>(0.18419)<br>[-2.48959] | -0.074134<br>(0.06527)<br>[-1.13585] | 0.017823<br>(0.64976)<br>[ 0.02743] | 0.051673<br>(0.12974)<br>[ 0.39827] |
| ΔORENTt-1 | -0.134741<br>(0.05048)<br>[-2.66918] | 2.095701<br>(0.46411)<br>[ 4.51556] | 0.879101<br>(0.54259)<br>[ 1.62018] | -0.717638<br>(0.19227)<br>[-3.73244] | 6.214892<br>(1.91411)<br>[ 3.24688] | 0.551140<br>(0.38221)<br>[ 1.44199] |
| ΔLMRENTt-1 | -0.004927<br>(0.00518)<br>[-0.95025] | 0.007180<br>(0.04767)<br>[ 0.15063] | 0.023351<br>(0.05573)<br>[ 0.41903] | 0.015692<br>(0.01975)<br>[ 0.79463] | 0.642263<br>(0.19659)<br>[ 3.26706] | 0.038547<br>(0.03925)<br>[ 0.98198] |
| ΔLGCt-1 | 0.001616<br>(0.02985)<br>[ 0.05414] | 0.376396<br>(0.27440)<br>[ 1.37169] | 0.481225<br>(0.32081)<br>[ 1.50004] | -0.064218<br>(0.11368)<br>[-0.56490] | 0.580204<br>(1.13172)<br>[ 0.51268] | -0.006196<br>(0.22598)<br>[-0.02742] |
| C | 0.052391<br>(0.01114)<br>[ 4.70161] | -0.331736<br>(0.10245)<br>[-3.23809] | -0.098491<br>(0.11977)<br>[-0.82231] | -0.079197<br>(0.04244)<br>[-1.86599] | -1.186065<br>(0.42253)<br>[-2.80707] | -0.128592<br>(0.08437)<br>[-1.52415] |
| DUMCOUP | -0.065499<br>(0.01433)<br>[-4.57029] | -0.421582<br>(0.13176)<br>[-3.19961] | -0.169419<br>(0.15404)<br>[-1.09982] | -0.036253<br>(0.05459)<br>[-0.66414] | -0.686339<br>(0.54342)<br>[-1.26300] | -0.206157<br>(0.10851)<br>[-1.89990] |
| DUMOIL | 0.090401<br>(0.02096)<br>[ 4.31248] | 0.527098<br>(0.19273)<br>[ 2.73497] | 0.185631<br>(0.22532)<br>[ 0.82386] | 5.585411<br>(0.07984)<br>[ 69.9554] | 0.128253<br>(0.79486)<br>[ 0.16135] | 0.463249<br>(0.15872)<br>[ 2.91872] |
| R-squared | 0.845152 | 0.656709 | 0.430602 | 0.995865 | 0.379550 | 0.524221 |
| Adj. R-squared | 0.787084 | 0.527975 | 0.217078 | 0.994315 | 0.146882 | 0.345803 |

**Note:** The Standard errors and t-statistics are given in parentheses **( )** and **[ ]** respectively.

In the economic growth of Ghana, we cannot neglect the effect of political instability which is captured in my model as exogenous. This may be noted that, the negative and significant result of DUMCOUP have adverse effect on the growth because political instability decrease economic growth. On contrary, the dummy variable (DUMOIL) is positive and significant which indicate that, the effect of oil exporting may boost growth as well. The coefficients of the ECT1 on exports, rents from oil and mineral are statistically significant which implies that they cannot be treated as weakly exogenous in the model. It appears that the ECMs of this multiple regression have been well specified. The disturbances are serially uncorrelated because Breusch-Godfrey LM test has a probability value of 44.81% which fail to reject the null hypothesis of no serial correlation. Furthermore, the ARCH LM test strongly suggest the absent of ARCH in the residuals because test has a probability value of 44.74% therefore we cannot reject the null hypothesis that, this model does not have heteroskedasticity (no arch effect).

## 4. Risks Related to Long-Run Growth

The empirical results shown in the previous section emphasize the importance of exports and natural resource rents as the main determinants of growth in Ghana. The risks related to long-run growth depends on two main factors:

### Risk 4.1: Exogenous factor effecting long-term growth

The prices of oil and mineral resource are sometimes volatile in the international market and they constituted large proportion of export revenue in Ghana. For that reason, when the expected future prices of these commodities fall, it may decrease real national incomes and pose problems for macroeconomic management by cutting down domestic investment which may slowdown economic growth in the future. Ghana's economic growth peaked in 2011 by 15% due to price booms from oil (USD 2.6 billion) and gold (USD 4.5 billion) in that year. As a result, the

country benefited from high export-price of these commodities. In 2013, growth declined to 7.6% as a result of fall in prices of its main export commodities in the international market after 2012. Herrera and Aykut (2014) argue that oil prices are falling due to growing supplies of conventional and unconventional oil, efficiency gains in production, and substitution away from oil towards alternative energy sources. And gold prices are expected to decline because the improving global financial conditions are expected to limit the demand for gold as a "safe-haven" investment asset. Hence, both oil and gold prices are expected to fall and are risk factors related to long-run growth in Ghana.

**Risk 4.2: Falling into Dutch Disease**

There is an enormous literature on negative effects of natural resources on development (see Sachs and Warner 2001) also known as Dutch disease. Dutch disease refers to a phenomenon where an emerging booming sector such as oil industry crowds out other important sectors (manufacturing and agricultural sectors) of the economy. This disease may not be universal for all countries with a booming sector, but for many countries it has happened after oil discoveries in developing countries such as; Iran, Iraq, Nigeria and Sudan among several others. Such countries often have slow rate of economic growth, rising inequality, rampant corruption and violent conflicts. In Nigeria the booming agricultural sector declined after the discovery of oil in 1956. According to the World Development Indicators (2015) agriculture contribution to economic growth in Ghana over the years has shown a steady decline from 35.4% in 2006 to 25.3% in 2011 and 21.9% in 2013. Moreover, the growth rate of the manufacturing sector has also reduced from 10.2 percent in 2006 to 6.8% in 2011 and further to a recording low of 5.8% in 2013. Hence, Dutch disease is gradually catching up with Ghanaian economy as manifested in the declining of it agricultural and manufacturing sectors.

Recent increase in government spending is a clear symptom of Dutch disease. Government spending in 2010 was 10.36% and increases from 16.64% in 2011 to 20.99% in 2012 which may attribute wholly to rise in export revenues from its booming sector in 2011. Hence, high government spending has becomes a channel through which Dutch disease transmits to the economy. Even though, it is important to discuss this issue further, but I do not have enough data to prove it empirically.

## 5. Conclusion and Policy Recommendations

### 5.1. Conclusion

The economic growth rate of Ghana was retarded in the 1970s and early 1980s due to political instability. After the structural adjustment programme in 1983, the economy responded positively from its negative growth. Moreover, economic growth peaked up in the early 2000s and has been exceptionally strong during the last five years, as a result of price booms of its main export commodities such as gold and cocoa, and more recently the discovery of oil.

I have examined the behaviour of economic factors such as export, physical capital formation, oil rents, mineral rents and government spending in explaining the long-run growth in using annual data for the period 1975 to 2013. The econometric models used for analyzing this paper was; Johansen cointegration test and the error correction modelling. The results of cointegration test reveal that there is one cointegrating vector explaining economic growth in the Ghanaian context. Finally, the error correction model validates the hypothesis that economic growth in the long-run is determined by export. In addition, mineral rents, and oil rents are important determinants of economic growth in Ghana which increases export receipts, but their associated risks are subject to uncertainty with international price volatility and so-called Dutch

disease (which is related to Ghana post-oil discovery) which may hinder the economic growth of Ghana in the long-run.

### 5.2. Policy Recommendations

It would be interesting to examine some policies related to economic determinants and its contributions to output in long-run.

- Government should invest in both manufacturing and agricultural sectors to flourish by using the revenue from oil, in order to avoid the risk of falling into a Dutch disease which is gradually manifesting in the Ghanaian economy.

- The government should strengthen the local financial sector and strive for its integration into the international financial market so that it can take advantage of the diverse financial instruments which will provide a hedge against it future revenues from export.

- The oil revenue should be channeled into a stabilisation fund which may be used as security to mitigate any future unexpected risk of price volatility in the market.

- In theory, it is believed that participation in international trade could improve economic growth in developing economies. Therefore, government should strengthen industrial policy on exports in order to attract multinational firms. This will help create employment opportunities which increase economic welfare in long-run.

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